1. Solve the modeling problem below, if possible.

   A new virus is spreading throughout the world. There were initially 3 many cases reported, but the number of confirmed cases has doubled every 4 days. How long will it be until there are at least 100000 confirmed cases?

   A. About 22 days

   B. About 26 days

   C. About 61 days

   D. About 42 days

   E. There is not enough information to solve the problem.

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2. For the information provided below, construct a linear model that describes her total costs, C, as a function of the number of months, x she is at UF.

   Aubrey is a college student going into her first year at UF. She will receive Bright Futures, which covers her tuition plus a $600 educational expense each year. Before college, Aubrey saved up $6000. She knows she will need to pay $1000 in rent a month, $70 for food a week, and $40 in other weekly expenses.

   A. $C(x) = 1440x$

   B. $C(x) = 1110$

   C. $C(x) = 1110x$

   D. $C(x) = 1440$

   E. None of the above.

---

3. For the scenario below, find the variation constant k of the model (if possible).

   In an alternative galaxy, the square of the time, T (Earth years), required for a planet to orbit Sun χ increases as the cube of the

distance, d (AUs), that the planet is from Sun χ increases. For example, when Ea's average distance from Sun χ is 7, it takes 54 Earth days to complete an orbit.

A. $k = 1000188.000$

B. $k = 3.841$

C. $k = 8.501$

D. $k = 4.028$

E. Unable to compute the constant based on the information given.

---

4. Solve the modeling problem below, if possible.

In CHM2045L, Brittany created a 21 liter 44 percent solution of chemical χ using two different solution percentages of chemical χ. When she went to write her lab report, she realized she forgot to write the amount of each solution she used! If she remembers she used 17 percent and 44 percent solutions, what was the amount she used of the 17 percent solution?

A. $10.50 liters$

B. $3.66 liters$

C. $-0.00 liters$

D. $21.00 liters$

E. There is not enough information to solve the problem.

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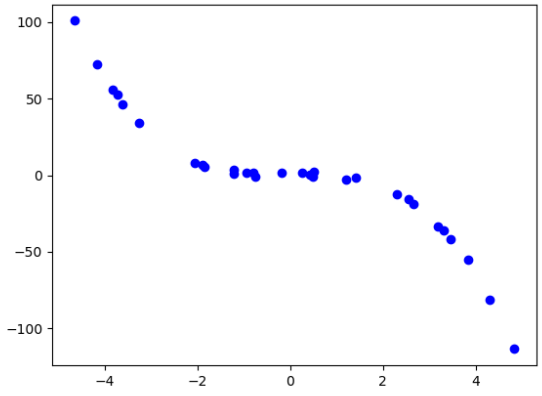
5. Determine the appropriate model for the graph of points below.



A. Linear model

B. Logarithmic model

C. Exponential model

D. Non-linear Power model

E. None of the above

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6. For the scenario below, use the model for the volume of a cylinder as $V = \pi r^2 h$.

   Pringles wants to add 33 percent more chips to their cylinder cans and minimize the design change of their cans. They've decided that the best way to minimize the design change is to increase the radius and height by the same percentage. What should this increase be?

   A. About 10 percent

   B. About 3 percent

   C. About 16 percent

   D. About 15 percent

   E. None of the above

---

7. For the scenario below, use the model for the volume of a cylinder as $V = \pi r^2 h$.

Pringles wants to add 37 percent more chips to their cylinder cans and minimize the design change of their cans. They've decided that the best way to minimize the design change is to increase the radius and height by the same percentage. What should this increase be?

A. About 18 percent

B. About 3 percent

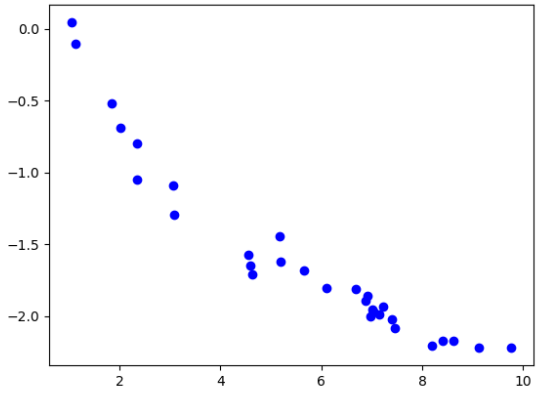
C. About 11 percent

D. About 17 percent

E. None of the above

---

8. Determine the appropriate model for the graph of points below.



A. Exponential model

B. Linear model

C. Non-linear Power model

D. Logarithmic model

E. None of the above

---

9. Solve the modeling problem below, if possible.

A new virus is spreading throughout the world. There were initially 8

many cases reported, but the number of confirmed cases has tripled every 3 days. How long will it be until there are at least 100000 confirmed cases?

A. About 29 days

B. About 26 days

C. About 11 days

D. About 12 days

E. There is not enough information to solve the problem.

---

10. Solve the modeling problem below, if possible.

In CHM2045L, Brittany created a 15 liter 10 percent solution of chemical χ using two different solution percentages of chemical χ. When she went to write her lab report, she realized she forgot to write the amount of each solution she used! If she remembers she used 8 percent and 35 percent solutions, what was the amount she used of the 8 percent solution?

A. $12.28 liters$

B. $1.11 liters$

C. $7.50 liters$

D. $13.89 liters$

E. There is not enough information to solve the problem.

---

11. Solve the modeling problem below, if possible.

A new virus is spreading throughout the world. There were initially 8 many cases reported, but the number of confirmed cases has doubled every 1 days. How long will it be until there are at least 100000 confirmed cases?

A. About 14 days

B. About 4 days

C. About 5 days

D. About 10 days

E. There is not enough information to solve the problem.

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12. For the scenario below, find the variation constant k of the model (if possible).

In an alternative galaxy, the cube of the time, T (Earth years), required for a planet to orbit Sun χ decreases as the square of the distance, d (AUs), that the planet is from Sun χ decreases. For example, when Ea's average distance from Sun χ is 10, it takes 67 Earth days to complete an orbit.

A. $k = 1.284$

B. $k = 30076300.000$

C. $k = 4.028$

D. $k = 3007.630$

E. Unable to compute the constant based on the information given.

---

13. For the scenario below, find the variation constant k of the model (if possible).

In an alternative galaxy, the square of the time, T (Earth years), required for a planet to orbit Sun χ decreases as the cube of the distance, d (AUs), that the planet is from Sun χ decreases. For example, when Ea's average distance from Sun χ is 10, it takes 91 Earth days to complete an orbit.

A. $k = 8.281$

B. $k = 4.428$

C. $k = 4.028$

D. $k = 8281000.000$

E. Unable to compute the constant based on the information given.

14. Solve the modeling problem below, if possible.

In CHM2045L, Brittany created a 25 liter 18 percent solution of chemical χ using two different solution percentages of chemical χ. When she went to write her lab report, she realized she forgot to write the amount of each solution she used! If she remembers she used 9 percent and 21 percent solutions, what was the amount she used of the 21 percent solution?

A. $9.79 liters$

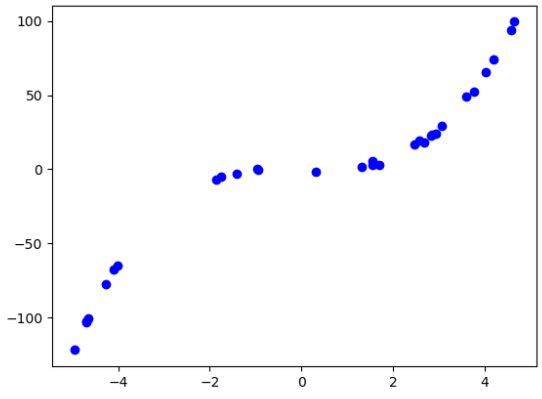
B. $18.75 liters$

C. $6.25 liters$

D. $12.50 liters$

E. There is not enough information to solve the problem.

15. Determine the appropriate model for the graph of points below.



A. Exponential model

B. Logarithmic model

C. Linear model

D. Non-linear Power model

E. None of the above

16. For the scenario below, use the model for the volume of a cylinder as $V = \pi r^2 h$.

Pringles wants to add 45 percent more chips to their cylinder cans and minimize the design change of their cans. They've decided that the best way to minimize the design change is to increase the radius and height by the same percentage. What should this increase be?

A. About 13 percent

B. About 22 percent

C. About 20 percent

D. About 15 percent

E. None of the above

17. For the scenario below, use the model for the volume of a cylinder as $V = \pi r^2 h$.

Pringles wants to add 49 percent more chips to their cylinder cans and minimize the design change of their cans. They've decided that the best way to minimize the design change is to increase the radius and height by the same percentage. What should this increase be?

A. About 22 percent

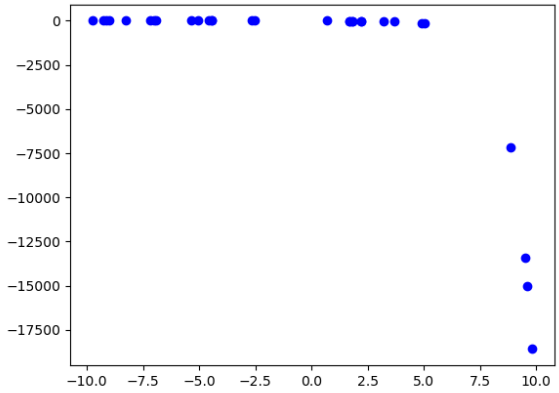
B. About 14 percent

C. About 16 percent

D. About 24 percent

E. None of the above

18. Determine the appropriate model for the graph of points below.



A. Exponential model

B. Logarithmic model

C. Linear model

D. Non-linear Power model

E. None of the above

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19. Solve the modeling problem below, if possible.

A new virus is spreading throughout the world. There were initially 6 many cases reported, but the number of confirmed cases has tripled every 5 days. How long will it be until there are at least 1000000 confirmed cases?

A. About 55 days

B. About 25 days

C. About 24 days

D. About 61 days

E. There is not enough information to solve the problem.

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20. Solve the modeling problem below, if possible.

In CHM2045L, Brittany created a 15 liter 10 percent solution of

chemical χ using two different solution percentages of chemical χ. When she went to write her lab report, she realized she forgot to write the amount of each solution she used! If she remembers she used 7 percent and 18 percent solutions, what was the amount she used of the 18 percent solution?

A. $5.09 liters$

B. $7.50 liters$

C. $10.91 liters$

D. $4.09 liters$

E. There is not enough information to solve the problem.

---

21. Solve the modeling problem below, if possible.

A new virus is spreading throughout the world. There were initially 4 many cases reported, but the number of confirmed cases has doubled every 5 days. How long will it be until there are at least 1000 confirmed cases?

A. About 17 days

B. About 28 days

C. About 15 days

D. About 40 days

E. There is not enough information to solve the problem.

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22. For the information provided below, construct a linear model that describes her total budget, B, as a function of the number of months, x she is at UF.

Aubrey is a college student going into her first year at UF. She will receive Bright Futures, which covers her tuition plus a $400 educational expense each year. Before college, Aubrey saved up $8000. She knows she will need to pay $900 in rent a month, $80 for food a week, and $48 in other weekly expenses.

A. $B(x) = 400x + 8000$

B. $B(x) = 8400 - 1028x$

C. $B(x) = 8000x + 400$

D. $B(x) = 8400 - 1412x$

E. None of the above.

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23. For the information provided below, construct a linear model that describes her total budget, B, as a function of the number of months, x she is at UF.

Aubrey is a college student going into her first year at UF. She will receive Bright Futures, which covers her tuition plus a $800 educational expense each year. Before college, Aubrey saved up $8000. She knows she will need to pay $1200 in rent a month, $80 for food a week, and $56 in other weekly expenses.

A. $B(x) = 8800 - 1336x$

B. $B(x) = 8800 - 1744x$

C. $B(x) = 800x + 8000$

D. $B(x) = 8000x + 800$

E. None of the above.

---

24. Solve the modeling problem below, if possible.

In CHM2045L, Brittany created a 20 liter 25 percent solution of chemical χ using two different solution percentages of chemical χ. When she went to write her lab report, she realized she forgot to write the amount of each solution she used! If she remembers she used 11 percent and 29 percent solutions, what was the amount she used of the 29 percent solution?

A. $4.44 liters$

B. $15.56 liters$

C. $10.00 liters$

D. $5.61 liters$

E. There is not enough information to solve the problem.

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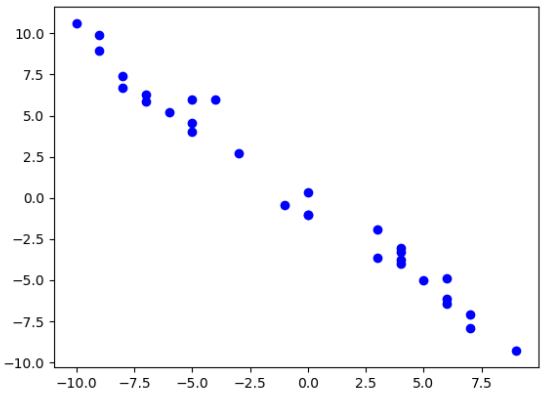
25. Determine the appropriate model for the graph of points below.



A. Logarithmic model

B. Exponential model

C. Linear model

D. Non-linear Power model

E. None of the above

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26. For the scenario below, use the model for the volume of a cylinder as $V = \pi r^2 h$.

Pringles wants to add 27 percent more chips to their cylinder cans and minimize the design change of their cans. They've decided that the best way to minimize the design change is to increase the radius and height by the same percentage. What should this increase be?

A. About 13 percent

B. About 8 percent

C. About 14 percent

D. About 3 percent

E. None of the above

---

27. For the scenario below, use the model for the volume of a cylinder as $V = \pi r^2 h$.

Pringles wants to add 24 percent more chips to their cylinder cans and minimize the design change of their cans. They've decided that the best way to minimize the design change is to increase the radius and height by the same percentage. What should this increase be?

A. About 3 percent

B. About 11 percent

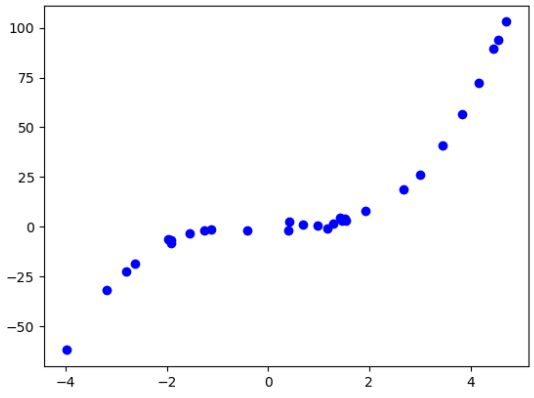
C. About 12 percent

D. About 7 percent

E. None of the above

---

28. Determine the appropriate model for the graph of points below.



A. Logarithmic model

B. Linear model

C. Non-linear Power model

D. Exponential model

E. None of the above

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29. Solve the modeling problem below, if possible.

A new virus is spreading throughout the world. There were initially 6 many cases reported, but the number of confirmed cases has quadrupled every 4 days. How long will it be until there are at least 1000000 confirmed cases?

A. About 49 days

B. About 35 days

C. About 20 days

D. About 18 days

E. There is not enough information to solve the problem.

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30. Solve the modeling problem below, if possible.

In CHM2045L, Brittany created a 24 liter 38 percent solution of chemical χ using two different solution percentages of chemical χ. When she went to write her lab report, she realized she forgot to write the amount of each solution she used! If she remembers she used 14 percent and 42 percent solutions, what was the amount she used of the 14 percent solution?

A. $12.00 liters$

B. $20.57 liters$

C. $10.45 liters$

D. $3.43 liters$

E. There is not enough information to solve the problem.
